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Design of wells in case of water coning

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Abstract

© Research India Publications. Wells drilled in the reservoirs with the bottom water drive are usually produced above the critical rate owing to economic reasons. This leads to water coning, or as called in case of horizontal wells a water crest, and breakthrough of water into the well. Water coning is described as a steady and usually sharp displacement of some or all the oil production by the bottom water when the critical withdrawal rate from the well is exceeded. Water coning may lead to several serious problems. A sample reservoir model is taken into consideration for optimization of oil production in the presence of water coning. Parameters to be optimized are well length and position of the well in the reservoir. Vertical and horizontal wells are both considered in this study. Two scenarios are considered: constant production rate and constant bottomhole flowing pressure. The optimum alternative is defined as the one which maximizes the economic profit. Moreover, the effects of some reservoir and fluid parameters on critical rate are analyzed.

Keywords

Crest, Ecrin, Optimization of horizontal wells, Rubis, Stimulation, Water coning, Well length and its position